

BCA Curriculum Scheme and Structure (Semester Wise)
To be effective from 2015

Semester-III

Course Code	Course Title	Marks		
		Internal	External	Total
BCA-SIII-01	Computer Organization And Architecture			100
BCA-SIII-02	Data Structures			100
BCA-SIII-03	Object Oriented Programming Concepts in C++			100
BCA-SIII-04	System Analysis And Design			100
BCA-SIII-05	Lab-I Data Structures	25	25	50
BCA-SIII-06	Lab-II Object Oriented Programming Concepts in C++	25	25	50

BCA 3rd Semester

Course Code: BCA-S3-01

Course Title: Computer Organization and Architecture

Unit-I

Data Representation: Binary numbers, binary codes, fixed point representation, floating point representation, error detection codes

Register Transfer and Micro- operation: Register transfer language, register transfer, bus and memory transfer, arithmetic micro-operations, logic micro operations, shift micro- operations.

Basic Computer Organization and Design: Instruction codes, computer registers, computer instructions, timing & control, instruction cycle, memory reference instructions, input – output and interrupts

Block diagram of computer, Von Neumann Machine, Operational Flow chart, Instruction cycle, Buses, addressing modes.

Unit – II

Organization of centre processing unit, Hardwired and Micro programmed control unit, general register organization, Instruction format, I/O organization , bus architecture and programming registers

Unit – III

Memory Hierarchy, Main memory, Addressing modes, Auxiliary memory, Associative memory, Cache memory, Virtual Memory, Hit-miss ratio, Magnetic Disk and its Performance, Magnetic Tape. Peripheral Devices, I/O interface Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA), Input output Processor and serial Communication, I/O controller, Asynchronous Data Transfer, Hand Shaking.

Unit –IV

Introduction to 8086 Microprocessor, Assembly Instruction Set, Assembly language Programming: Addition, Subtraction, Comparison, etc; Concepts of Pipelining.

Reference Books:

1. William Stalling, "Computer Organization & Architecture", Pearson Education
2. Morris Mano, "Computer System Architecture", Pearson Education
3. Zaky & Hamacher, "Computer Organization", TMH
4. B.Ram,"Computer Fundamental Architecture & Organization," New Age.
5. Tannenbaum, "Structure Computer Organization," Pearson Education.
6. Assembly references.

Proposed Semester based syllabus for BCA to be effective from 2015

Course Code: BCA-S3-02

Course Title: Data Structures

Unit-I

Data Structure Basics: Basic Terminology, Built-in Data Structures in C: An overview. Data Structure and Data Operations, Algorithm Complexity, Linear Arrays and their Representation in Memory, Traversing, Inserting and Deleting Algorithms in Linear Arrays.

Stacks: Stacks and their representation in memory and their implementations

Polish Notations, Evaluation of Postfix, Infix, Prefix Expressions

Queues: Queues and their representation in memory , and their implementations De-Queues , Priority Queues.

Unit-II

Linked Lists: Singly and Doubly Linked List and their implementations. Concepts of Circular Linked Lists. Dynamic Memory Allocations

Unit-III

Trees: Introduction, Trees terminology Binary Tree and their representation in memory, Traversing Binary Trees.

Graphs: graph terminology, Sequential representation of Graphs, Shortest Path Algorithms, Traversing a Graph: BFS, DFS Algorithms.

Unit-IV

Sorting and Searching Algorithms: Linear Search, Binary Search, Bubble Sort, Insertion Sort, Selection Sort, Quick Sort, Merge Sort and their analysis with regard to time complexity.

Reference Books:

1. Balaguruswamy, Programming in ANSI C, Tata McGraw Hill.
2. Torrence W Pratt, Programming Language Design and Implications, PHI.
3. Gottfried Programming with C.
4. Trebley and Sorenson, An Introduction to Data Structure with Application, McGraw Hill, Kongakusha 1976.
5. Horowitz and Sahni, Data Structures, Sbc's Publication, 1980.
6. Michael J. Folk Etial, File Structure An Object Orient Approach with C++.

Proposed Semester based syllabus for BCA to be effective from 2015

Course Code: BCA-S3-03

Course Title: Object Oriented Programming Concepts in C++

Unit-I

Introduction to the Object Oriented Languages: Concepts of Classes and Objects, Data Abstraction, Encapsulation, Reusability, polymorphism. Elements of the Programming Language (C++): Control Statements, Input/Output Functions, Pointers, structures, Classes and Objects, Scope resolution operator, Class members.

Unit-II

Constructor: parameterized & unparameterized constructors, copy constructor. Destructor, Friend Functions. Inline functions: Explicit & Implicit Inline Functions. Overloading: Function overloading and Operator Overloading (Overloading unary & binary operators).

Unit-III

Inheritance: Single and Multiple Inheritance, Concepts of Derived & Base classes, Access specifier under Inheritance. Concepts of Ambiguity in Multiple inheritance.

Unit-IV

Polymorphism: Early binding & Late binding. Virtual Functions & Abstract classes. Streams: I/O Streams and File Streams, I/O Manipulators

Reference Books:

1. James Rumbaugh, "Object Oriented Models and Design" Pearson Education Harrington. "C & Object Oriented Paradigm" John Wiley & sons Publication.
2. Ali Brhrani "Object Oriented Systems Development" McGraw – Hill 1999.
3. Lafore Robert, "Object Oriented programming in C++", Galgotia Publications.
4. Balagurusamy, E, "Object Oriented with C++", Tata McGraw-Hill.
5. D.Ravichandran, "Programming with C++", McGraw-Hill Publication

Course Code: BCA-S3-04

Course Title: System Analysis and Design

Unit-I

System definition and concepts, Real life business systems, Types of systems, System models, Types of information systems, basic principles of successful systems.

System Development life Cycle- overview.

Phases of System Development life Cycle - Initial investigation, Feasibility study, Analysis, Design, Development, Implementation, Maintenance.

Life Cycle models, system documentation considerations – Principles of system documentation, Types of documentations.

Unit-II

Systems planning and analysis – planning systems for an organization, the pre – design phase, initial investigation- problem definition & project initiation, background analysis, data & fact gathering techniques, fact analysis ; Feasibility study – technical, social & economic feasibility; Feasibility report, Analysis – Structured analysis methods & tools, system selection; Cost-benefit analysis- characteristics of costs & benefits, Net benefit analysis, present value analysis, net present value, pay back analysis, Break-even analysis, cash flow analysis, return on investment

Unit-III

Tools & techniques for modeling – Data Flow Diagrams, Data Dictionary, Decision tree, Decision table, Structured English, Entity Relation Diagrams, System flow charts; System design & modeling – overview of the design phase , Logical & Physical design, design process modeling & representations, data modeling & P design, normalization of data, file design, database design, Inputs and outputs; Forms- classification, form design; Input design- using source documents, controls, on-line & off-line data entry, machine readable media inputs; Output design – output devices overview, controls in outputs; User Interface design, Graphical interface – elements of graphical interfaces;

Unit-IV

Modular & structured design – overview, introduction to structured design concepts, tools for structured design, modular design strategies, module coupling & cohesion, specifications. System development, Implementation & Maintenance – planning for the post design activities, testing & validation, system implementation, evaluation & performance, system quality control & assurance, maintenance. System audit & security- audit of computer system usage, audit trails, types of threats to computer systems and control measures (risk analysis, control measures, contingency planning & disaster recovery). Managing software projects – projects & project management, planning projects (Using Gantt charts, PERT/CPM), monitoring & controlling, case studies.

Reference Books:

1. Haryszkiewicz, T.T., "Introduction of System Analysis and Design". Prentice Hall of India, New Delhi.
2. Rajaraman, V., "Analysis and Design of Information Systems". Prentice Hall of India, New Delhi.
3. Senn, J.A., "Analysis and Design of Information System". Tata McGraw Hill Book Company.
4. Whiten, J.K., Bentley, L.D., V.M., "Systems Analysis and Design Methods". Galgotia publications Pvt. Ltd.
5. Kendall, "System Analysis and Design", Pearson Education.